"All-in-one" synthesis and self-assembly of naked Ag nanoparticles

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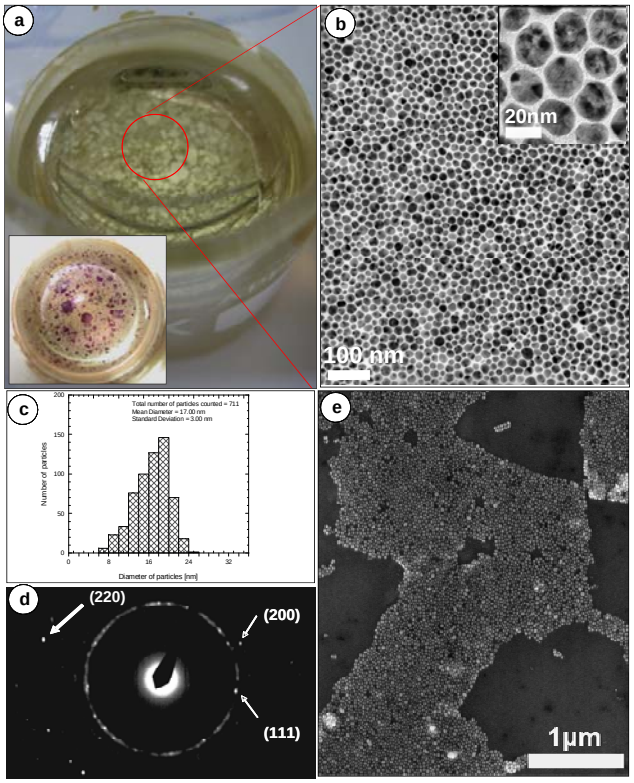
Conventional self-assembly research involves multi-step methods; namely synthesis, purification and assembly. Indeed, the common starting point is a pre-synthesized sample of monodisperse colloidal nanoparticles with a given size and shape, followed by a purification process, achieved through a variety of size-selection techniques. Finally, the assembly process is typically carried out by means of various liquid-liquid or air-liquid interfacial techniques, such as Langmuir-Blodgett (LB) films, solvent evaporation, or DNA-templated method. In many cases self-assembly is attained at the very same C-coated copper TEM grid.



A 2-D array of naked Ag nanoparticles has been synthesized through interfacial reduction of Ag^{+} under hydrothermal conditions. The process bestows the synthesis, nucleation, growth and self-assembly of the nanoparticles in a simple one-pot reaction and makes use of no additive or capping agent.[1] The resulting macroscopic liquid silver mirror is highly stable and composed of tightly packed naked Ag nanoparticles (17(3) nm diameter, with interparticle gaps of 1.3(1.0) nm) which can be easily transferred to a given substrate for application.

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References
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